

## CLAIMS

1. An astaxanthin medium-chain fatty acid ester produced by using a lipase, and a composition comprising the same.
2. The astaxanthin medium-chain fatty acid ester and the  
5 composition comprising the same according to claim 1, wherein the medium-chain fatty acid ester is a medium-chain fatty acid monoester or medium-chain fatty acid diester.
3. The astaxanthin medium-chain fatty acid ester and the composition comprising the same according to claim 2,  
10 wherein the medium-chain fatty acid is a fatty acid having 8 to 12 carbon atoms.
4. The astaxanthin medium-chain fatty acid ester and the composition comprising the same according to claim 3, wherein the medium-chain fatty acid has an even number of  
15 carbon atoms.
5. The astaxanthin medium-chain fatty acid ester and the composition comprising the same according to claim 4, wherein the medium-chain fatty acid has 8 carbon atoms.
6. The composition according to any one of claims 1 to 5,  
20 which comprises the astaxanthin medium-chain fatty acid ester in an amount of at least 0.1%.
7. Astaxanthin octanoic acid monoester, astaxanthin octanoic acid diester, or a composition comprising at least either one of these compounds.
- 25 8. A method of producing the astaxanthin medium-chain fatty acid ester and the composition comprising the same according to any one of claims 1 to 6, by using a lipase.
9. The method according to claim 8, wherein an

esterification and/or transesterification is carried out using one or more astaxanthin materials selected from the group consisting of a free astaxanthin, an ester form astaxanthin different from a medium-chain fatty acid ester, 5 and a mixture of ester form astaxanthins different from a medium-chain fatty acid ester; and one or more medium-chain fatty acid materials selected from the group consisting of a free medium-chain fatty acid, a medium-chain fatty acid monoglyceride, a medium-chain fatty acid diglyceride, a 10 medium-chain fatty acid triglyceride, and a medium-chain fatty acid lower alcohol ester.

10. The method according to claim 8 or 9, wherein the lipase is one or more of lipases selected from the group consisting of a lipase derived from yeast belonging to 15 Candida, lipase derived from a microorganism belonging to Chromobacterium, a lipase derived from a microorganism belonging to Alcaligenes, and a lipase derived from animal pancreas.

11. The method according to claim 10, wherein the lipase 20 is derived from yeast belonging to Candida.

12. The method according to any one of claims 9 to 11, wherein the astaxanthin material is free astaxanthin and/or a mixture of different types of ester form astaxanthins, and the medium-chain fatty acid material is a medium-chain 25 fatty acid triglyceride.

13. The method according to any one of claims 8 to 12, wherein water is added.

14. The method according to claim 13, wherein water is

added at the amount of 0.5 w/w to 20 w/w % with respect to the amount of the oil material.

15. A food composition obtained by mixing the food and the composition comprising the astaxanthin medium-chain fatty acid ester according to any one of claims 1 to 6 or the composition comprising the composition according to claim 7 for specific nutritive requirements, or food thereof.

16. A food additive, which comprises the composition comprising the astaxanthin medium-chain fatty acid ester according to any one of claims 1 to 6 or the composition comprising the composition according to claim 7.

17. A cosmetic, which comprises the composition comprising the astaxanthin medium-chain fatty acid ester according to any one of claims 1 to 6 or the composition comprising the composition according to claim 7.

18. An animal feed, which comprises the composition comprising the astaxanthin medium-chain fatty acid ester according to any one of claims 1 to 6 or the composition comprising the composition according to claim 7.

19. A method of producing the astaxanthin octanoic acid monoester, the astaxanthin octanoic acid diester, or the composition comprising at least one of these compounds according to claim 7,

said method comprising the following steps (a) and (b):

(a) a step of extracting said compound from Crustacea using a solvent or supercritical CO<sub>2</sub>, and

(b) a step of purifying said compound from the extract

obtained by the step (a).

20. The method according to claim 19, wherein Crustacea is Euphausiacea.